THE INTERACTION BETWEEN THE EU'S CLIMATE CHANGE OBJECTIVES AND ITS STATE AID REGULATION IN THE AREA OF RENEWABLE ENERGY

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Abstract: This paper analyses the interaction between the EU's climate change objectives and its state aid regulation in the area of renewable energy through the chronology of the adoption of the EU's key policy documents and related legislation. The EU's state aid rules impose certain restrictions on the public financing of renewable energy, which is crucial for reaching the EU's climate change objectives in due time. The paper identifies four challenges in this respect. The ultimate challenge for the EU is how to reconcile science, the market economy and energy politics. Another challenge for the EU was the diverging national energy policies before the 'energy title' was introduced in the Lisbon Treaty. The third challenge for the Commission is how to move the climate change issues up to the top decision-making level. The final challenge is the state aid framework that supports climate change mitigation, whose upcoming changes should address the gap between ambition and reality. The paper aims to assess the policy consistency of the EU's climate change legislation in order to determine whether the EU's credibility as a 'green leader' is just nominal. The notion of 'nominal green leader' is related to the consistency of the EU's climate change legislation which seems not to have had the expected effect determined by the Kyoto Protocol and Paris Agreement. The paper brings the ambitious policies face to face with the data on state aid provided for climate and energy targets and compares them with the technological expectations in renewable energy deployment. The question that arises is whether it is time for the EU to balance the understanding of 'common interest' more towards climate change mitigation at the expense of certain elements of competition policy.

Keywords: climate change, competition, electricity generation, internal market, renewable energy, state aid.

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1 Introduction

The role of the European Union in supporting climate change mitigation, accepting the commitments of the Kyoto Protocol[1] and the Paris Agreement,[2] has been extremely important for two reasons. Primarily, the EU was, globally, one of the most developed regions in economic terms and in terms of industry. Moreover, the EU has also been shaping a political association in Europe, able and willing to contribute to the global goal.

It has been established that, during the 1990s, '[e]lectricity generation and industry [were] responsible for the highest emissions […]',[3] since 'in Europe, almost half of the electricity is produced in thermal power plants […]'.[4] The importance of the increased use of renewable energy has been confirmed by the Intergovernmental Panel on Climate Change (IPCC) Special Report 2018 which indicates that electrification will be 'leading to a 3.5- to 6-fold increase in electricity demand […] by the end of the century relative to today […]'.[5] These scientific findings pose an increasing challenge for renewable energy electricity generation and maintaining the security of supply. Therefore, the main focus of this paper and the used indicators are related to renewable electricity generation.

Accordingly, the EU's climate and energy policy primarily focuses on energy reform where again electricity supply and generation adequacy are dominant concerns regarding the intermittency characteristics of renewable electricity generation. However, the implementation of the EU's obligations under the Kyoto Protocol and Paris Agreement has from the very beginning faced four challenges concerning the integration of its climate change objectives into its competition policy and state aid rules. These challenges are still relevant for an understanding of the interaction between the EU's climate change objectives and state aid reg-

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[1] United Nations, 'Kyoto Protocol to the United Nations Framework Convention on Climate Change' <https://unfccc.int/resource/docs/convkp/kpeng.pdf> accessed 1 June 2019.

[2] United Nations, 'Paris Agreement' <https://unfccc.int/sites/default/files/english_paris_agreement.pdf> accessed 1 June 2019 (Recital 4).

[3] Nele Dhondt, *Integration of Environmental Protection into Other EC Policies. Legal Theory and Practice* (Europa Law Publishing 2003) 383.

[4] ibid, 382.

[5] Joeri Rogelj and others, 'IPCC Special Report 2018: Chapter 2. Mitigation Pathways Compatible with 1.5°C in the Context of Sustainable Development' in Valérie Masson-Delmotte and others (eds), *Global Warming of 1.5°C. An IPCC Special Report on the Impacts of Global Warming of 1.5°C above Pre-Industrial Levels and Related Global Greenhouse Gas Emission Pathways, in the Context of Strengthening the Global Response to the Threat of Climate Change, Sustainable Development, and Efforts to Eradicate Poverty* (UNFCCC – IPCC 2018) 139 <www.ipcc.ch/site/assets/uploads/sites/2/2019/05/SR15_Chapter2_Low_Res.pdf> accessed 23 August 2019.

ulations related to renewable energy. They deserve to be addressed, since the results of the efforts taken to cope with these challenges directly impact on the EU's ability to meet its own commitments. Although the research on the impact of general competition policy on renewable energy deployment deserves assessment, the focus of this paper is on state aid regulation, in particular state resources needed to meet EU climate and energy targets by 2030.

The EU's state aid rules pose certain restrictions on public financing of renewable energy, which is crucial for reaching the EU's climate change objectives in due time. A problem emerges where the urgency of climate change mitigation identified by the IPCC forces the EU to attempt unprecedented technological change in energy generation. The need to support the deployment of renewable energy, shut down coal plants, and limit the use of hydropower and nuclear energy due to environmental and security issues raises concerns over the viability of that process. Two primary worries relate to state aid regulations and the security of supply of electricity. State aid rules prohibit the use of public resources in economic activities where market competition can be distorted and trade affected. However, strict scrutiny of state aid for renewable energy could lead to problems with the future security of supply and the inability to meet the expected timeframe for mitigating climate change. Therefore, the paper argues that the ultimate challenge for the EU is how to reconcile science, the market economy and energy politics described as a 'tension between science and politics'[6] where the Commission is a 'catalyst', understanding that 'without science, its proposals will not be sound, yet without politics they will not be implementable'.[7]

Another challenge for the EU has been that of diverging national energy policies before the 'energy title' was introduced in the Lisbon Treaty. This challenge will be addressed through an analysis of the legal base that opened the way towards the EU Energy Policy. The third challenge for the Commission is how to move the climate change issues to the top decision-making level. The paper indicates that the 'energy packages' are used to bring out climate change issues. Since energy reform towards climate change mitigation requires state incentives, the final challenge is a state aid framework that supports climate change mitigation, whose upcoming changes should address the gap between ambition and reality.

The chronology of the adoption of the EU's key policy documents and related legislation show that these challenges are addressed by the Commission through causality and in a systemic way in accordance with

[6] Jonas Dreger, *The European Commission's Energy and Climate Policy. A Climate for Expertise?* (1st edn, Palgrave Macmillan 2014) 1.

[7] ibid, 158.

the available science. However, the effects of this approach remain questionable in the light of recent data on the efforts of climate change mitigation. The European Environment Agency (EEA) has raised concerns that 'achieving the 2020 targets is increasingly uncertain'[8] while the International Energy Agency (IEA) has underlined that 'Renewable power needs to expand significantly to meet the IEA Sustainable Development Scenario share of half of generation by 2030'.[9] In this respect, it can be argued that the chronology of the EU's climate change policy and legislation confirms its consistency, but considers EU credibility as a 'green leader' as 'nominal' due to relevant empirical data. Nevertheless, this could change if the EU addresses the issues of residual market failures in RES electricity generation and enhances the use of available EU funds to match Member State's state aid provided for that purpose. The ongoing 'fitness check' of state aid legislation in this area could bring positive developments if it reconciles competition policy with climate and energy policy, taking into consideration the available science and development of energy-related technologies.

2 'Tension between science and politics': reconciling science, the market economy and energy politics

The first serious attempt to combat climate change at the global level was the Kyoto Protocol[10] under the United Nations Framework Convention on Climate Change. This international agreement committed its Parties by setting internationally binding emission reduction targets. The European Union and its Member States are Parties to this agreement. The Kyoto Protocol was adopted on 11 December 1997 and entered into force on 16 February 2005 while its first commitment period started in 2008 and ended in 2012. During the first commitment period, the Parties, including the European Community, committed to reducing GHG emissions to an average of 5% against 1990 levels. During the second commitment period, the Parties have committed to reducing GHG emissions by at least 18% below the 1990s' levels in the eight-year period from 2013 to 2020.[11] The role of the European Union in supporting climate change mitigation at the time was extremely important for two reasons. Primarily, the EU was, globally, one of the most developed regions in economic terms and in terms

[8] European Environment Agency, 'Final Energy Consumption by Sector and Fuel in Europe' (31 January 2020) available at <www.eea.europa.eu/data-and-maps/indicators/final-energy-consumption-by-sector-10/assessment> accessed 19 February 2020.

[9] International Energy Agency, 'Renewable Power: Tracking Progress 2020' available at <www.iea.org/fuels-and-technologies/renewables> accessed 19 February 2020.

[10] United Nations (n 1).

[11] UNFCCC, 'What Is the Kyoto Protocol?' <https://unfccc.int/kyoto_protocol> accessed 1 July 2019.

of industry. Moreover, the EU was also forming a political association in Europe, able and willing to contribute to the global goal.

Dhondt provides important data about emissions and the European share in global pollution in the 1990s, based on the figures from the European Environmental Agency (EEA), the International Environmental Agency (IEA), OECD, and European Commission reports:

> Reportedly, around 80% of total world-wide anthropogenic CO_2 emissions find their origin in the combustion of fossil fuels including that for transport and industry. Emissions in Europe are approximately 30 per cent of this total. In 1990 around 95% of SO_2 emissions and 97% of NOx come from the combustion of fossil fuels in Europe. Electricity generation and industry are responsible for the highest emissions because they use the most energy as well as the highest sulphur-content fuels.[12]

At the same time 'in Europe, almost half of the electricity is produced in thermal power plants using fossil fuels, in particular coal, oil and gas'.[13] The obligations taken on by the EU have directly prompted a number of Community projects on the development of renewable energy sources, building on the pre-Kyoto EU initiatives and have triggered the issue of subsidising alternative (non-hydro) renewable energy projects, such as wind farms and solar fields, by the Member States.[14]

The ultimate challenge that emerged was how to reconcile science, the market economy and politics in the EU that are so closely interrelated when it comes to state aid needed for the increased use of renewable energy. Jonas Dreger[15] describes it as 'tension between science and politics', arguing that in cases involving energy and climate issues the Commission often ends up as 'catalysts between knowledge and politics', understanding that 'without science, its proposals will not be sound, yet without politics they will not be implementable'.[16] The positive circumstance for initial climate and energy policy development and implementation was the 10 year period between the adoption and commencement of the first commitment period of the Kyoto protocol. Nevertheless, it has to be noted that both the European Community and the EU had already initiated pioneering, although small-scale, programmes and policy documents on renewable energy and environment protection in the 1980s and the early 1990s.[17] However, Dreger notes that 'by the end of the 1990s

[12] Dhondt (n 3) 383.

[13] ibid, 382.

[14] ibid, 416-420.

[15] Dreger (n 6) 1.

[16] ibid, 158.

[17] Dhondt (n 3) 410-420.

the Commission was deeply frustrated by the limited progress that it had achieved on energy-policy harmonization'[18] due to the diverging national energy policies. This was another challenge on account of the institutional and legal background of the Commission's position, since its competence in the field of energy was limited before the energy chapter was introduced in the Lisbon Treaty. The third challenge for the Commission was how to move the climate change issues to the top decision-making level. Nevertheless, Dreger identified 'favorable political circumstances with a rising interest in climate change'[19] at the end of 20th and the beginning of the 21st century as an important aspect that provided the Commission with 'increasing ambition' to put forward more policy and legal initiatives related to renewable energy, security of electricity supply and environmental protection. Since such initiatives were extremely expensive, state intervention and incentives towards more clean energy were necessary. Therefore, the final challenge was how to regulate state aid covering all these processes while avoiding the potential threat to market competition. The challenges were addressed in interaction, where one was used in dealing with the other. This can be seen from the chronology of EU policy developments and legislative activities through successive energy packages, state aid reforms and climate and energy frameworks. The climate change threat could not be addressed without changes in energy policy. Energy policy could not be changed without the use of scientific findings from the IPCC and technological developments in the energy sector. Technological developments related to the use of renewable energy sources could not initially become viable without state incentives and the unbundling process, liberalisation in trading with electricity and eliminating monopolies. Consequently, state incentives had to be regulated through state aid frameworks supporting energy and climate policy while preventing distortions of competition and trade.

3 The chronological background to the interaction

A chronological approach to an analysis of the interaction between international commitments, EU policy developments and the adoption of binding legal documents in the area of the environment, energy and state aid provides a general view of the practical impact of climate change prevention efforts on EU state aid policy and law.

Since the mid-1990s, the EU has undertaken four major reforms in the electricity and energy sector in general to establish its internal energy market.[20] These reforms resulted in a number of Directives and

[18] Dreger (n 6) 111-112.

[19] ibid.

[20] Frédéric Gouardères, 'Internal Energy Market' (2019) Fact Sheets on the European Union - 2019 <http://www.europarl.europa.eu/ftu/pdf/en/FTU_2.1.9.pdf> accessed 19 August 2019.

Regulations collected in three successive 'energy packages' and the latest 'Clean Energy for All Europeans' Package.[21] The First Energy Package was adopted in 1996 and the transposition of its electricity part commenced in 1997. The same year, the Commission delivered the White Paper – Energy for the Future: Renewable Sources of Energy.[22] In 2000, the Commission developed the Green Paper: Towards a European Strategy for the Security of Energy Supply.[23]

In 2001, detailed rules for the implementation of the Kyoto Protocol, known as the 'Marrakesh Accords', were adopted, establishing the first commitment period 2008-2012 for combating climate change. In the field of energy, the EU adopted the Renewable Energy Directive in 2001,[24] at the same time as the Community guidelines on state aid for environmental protection.[25] The Buildings Energy Performance Directive[26] followed in 2002. In 2003, the Emissions Trading Scheme Directive[27] was adopted in parallel with the Second Energy Package, whose transposition began a year later together with the CHP Directive.[28] All these actions and documents adopted by the EU institutions provided a good foundation before

[21] Commission, Publications Office of the European Union, 'Clean Energy for All Europeans' (2019) <https://publications.europa.eu/en/publication-detail/-/publication/b4e46873-7528-11e9-9f05-01aa75ed71a1/language-en?WT.mc_id=Searchresult&WT.ria_c=null&WT.ria_f=3608&WT.ria_ev=search> accessed 20 July 2019.

[22] Commission, 'Communication from the Commission, Energy for the Future: Renewable Sources of Energy, White Paper for a Community Strategy and Action Plan' COM(97) 599 Final, Brussels <http://aei.pitt.edu/1130/1/energy_white_paper_COM_97_599.pdf> accessed 19 August 2019.

[23] Commission, 'Green Paper Towards a European Strategy for the Security of Energy Supply' COM(2000) 769 Final <http://aei.pitt.edu/1184/1/enegy_supply_security_gp_COM_2000_769.pdf> accessed 19 August 2019.

[24] Directive 2001/77/EC of the European Parliament and of the Council of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity market [2001] OJ L283/33 <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32001L0077&from=EN> accessed 19 August 2019.

[25] Commission, 'Community Guidelines on State Aid for Environmental Protection' [2001] Official Journal OJ C 037, 03/02/2001 P 0003/3 – 0015 <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32001Y0203(02)&from=EN> accessed 19 August 2019.

[26] Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the Energy Performance of Buildings [2003] OJ L1/65 <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32002L0091&from=EN> accessed 19 August 2019.

[27] Commission, 'Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 Establishing a Scheme for Greenhouse Gas Emission Allowance Trading within the Community and Amending Council Directive 96/61/EC' (Text with EEA Relevance) [2003] OJ L275/32 <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32003L0087&from=EN> accessed 19 August 2019.

[28] Commission, 'Directive 2004/8/EC of the European Parliament and of the Council of 11 February 2004 on the Promotion of Cogeneration Based on a Useful Heat Demand in the Internal Energy Market and Amending Directive 92/42/EEC' [2004] OJ L52/50 <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32004L0008&from=EN> accessed 19 August 2019.

the Kyoto Agreement was enforced in 2005. That same year, the State Aid Action Plan[29] was adopted as a comprehensive inventory of state aid legislation that should correspond to new policies aiming at more market integration, growth, and jobs. It was followed by the Commission's document 'An Energy Policy for Europe'[30] in 2006 and the finalisation of the transposition of the Second Energy Package. The Council's Conclusions[31] of March 2007 represented a surprising breaking point. As Dreger writes: 'The European Council's 20-20-20 agreement from spring 2007 closely links the climate and energy policy agenda'.[32] This approach would be followed in the new State Aid Guidelines for Environmental Protection[33] in 2008, the starting year for the first commitment period under Kyoto. A year later, the Gas Emissions Commitments[34] were adopted, as were the Third Energy Package and the Renewable Energy Directive[35] (RED 2009). The first decade of the 21st century ended with the adoption of the EU Energy Strategy 2020.[36]

The first commitment period under Kyoto ended in 2012 and the Doha Amendment to the Kyoto Protocol was adopted, introducing the

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[29] Commission, 'State Aid Action Plan - Less and Better Targeted State Aid: A Roadmap for State Aid Reform 2005-2009' (Consultation Document) COM/2005/0107 Final <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52005DC0107&from=EN> accessed 1 April 2019.

[30] Commission, 'Communication from the Commission to the European Council and the European Parliament, An Energy Policy for Europe' COM(2007) 1 Final, <www.europarl.europa.eu/meetdocs/2004_2009/documents/com/com_com(2007)0001_/com_com(2007)0001_en.pdf> accessed 19 August 2019.

[31] European Council, 'Presidency Conclusions' - Brussels European Council 8/9 March 2007, 7224/1/07 REV 1 CONCL 1 <www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/93135.pdf> accessed 11 August 2019.

[32] Dreger (n 6) 111.

[33] Commission, 'Community Guidelines on State Aid for Environmental Protection' (Text with EEA Relevance) [2008] OJ C82/1 <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A52008XC0401%2803%29> accessed 19 August 2019.

[34] European Parliament and the Council, 'Decision No 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the Effort of Member States to Reduce Their Greenhouse Gas Emissions to Meet the Community's Greenhouse Gas Emission Reduction Commitments up to 2020' [2009] OJ L140/136 <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009D0406> accessed 11 August 2019.

[35] European Parliament and the Council, 'Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the Promotion of the Use of Energy from Renewable Sources and Amending and Subsequently Repealing Directives 2001/77/EC and 2003/30/EC (Text with EEA Relevance) [2009] OJ L140/16 <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32009L0028>.

[36] Commission, 'Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Energy 2020 A Strategy for Competitive, Sustainable and Secure Energy COM(2010) 639 Final <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52010DC0639&from=EN> accessed 18 July 2019.

second commitment period 2012-2020. The same year, the Commission developed a document 'Renewable Energy: A Major Player in the European Energy Market'[37] and introduced the Green House Gas Emissions Trading State Aid Guidance.[38] Accordingly, the State Aid Modernisation[39] (SAM) was adopted in 2012, too, as well as the Energy Efficiency Directive,[40] followed by the Guidance[41] on RES Support Schemes a year later. Two key state aid documents, the General Block Exemption Regulation (GBER 2014)[42] and the Energy and Environment Aid Guidelines (EEAG 2014-2020),[43] followed as intended support to RES development and environment protection while protecting the common market. By 2014, the European Council had adopted a Conclusion on the EU Climate and Energy Framework 2020-2030,[44] calling for a 40% reduction in emissions and a 27% increase in renewable energy use by 2030, and for a 27% increase in energy efficiency. It was a year before the adoption of the Paris Agreement. While signing up to the Paris commitments, the EU had, in

[37] Commission, 'Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Renewable Energy: A Major Player in the European Energy Market COM(2012) 271 Final' <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52012DC0271&from=EN> accessed 18 July 2019.

[38] Commission, 'Communication from the Commission, Guidelines on Certain State Aid Measures in the Context of the Greenhouse Gas Emission Allowance Trading Scheme Post-2012 (SWD(2012) 130 Final) (SWD(2012) 131 Final (Text with EEA Relevance) (2012/C 158/04)' <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A52012XC0605%2801%29> accessed 2 June 2019.

[39] Commission, 'Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, EU State Aid Modernisation (SAM) COM/2012/0209 Final' <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52012DC0209&from=EN> accessed 1 April 2019.

[40] Commission, 'Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on Energy Efficiency, Amending Directives 2009/125/EC and 2010/30/EU and Repealing Directives 2004/8/EC and 2006/32/EC [2012] OJ L315/1' <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012L0027&from=EN> accessed 22 August 2019.

[41] Commission, 'Commission Staff Working Document, European Commission Guidance for the Design of Renewables Support Schemes Accompanying the Document Communication from the Commission Delivering the Internal Market in Electricity and Making the Most of Public Intervention SWD(2013) 439 Final <https://ec.europa.eu/energy/sites/ener/files/com_2013_public_intervention_swd04_en.pdf> accessed 18 July 2019.

[42] Commission, 'Commission Regulation (EU) No 651/2014 of 17 June 2014 Declaring Certain Categories of Aid Compatible with the Internal Market in Application of Articles 107 and 108 of the Treaty Text with EEA Relevance [2014] OJ L187/1 <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L_.2014.187.01.0001.01.ENG>.

[43] Commission, 'Communication from the Commission — Guidelines on State Aid for Environmental Protection and Energy 2014-2020' [2014] OJ C200/1 <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52014XC0628%2801%29>.

[44] Council, 'European Council Conclusions (23 and 24 October 2014) EUCO 169/14, 24 October 2014' <https://www.consilium.europa.eu/media/24561/145397.pdf>.

parallel, adopted the Energy Union Package[45] in the field of energy, and the Enabling Regulation 2015[46] in the field of state aid.

The Paris Agreement, which entered into force on 4 November 2016, builds on the UNFCCC and Kyoto Protocol with the 'central aim to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius'.[47] The EU and its Member States are Parties to the Paris Agreement among the 55 initial Parties to the Convention, accounting in total for at least an estimated 55% of total global greenhouse gas emissions.[48] At the time of the entry into force of the Paris Agreement, the EU's public support to energy was estimated to be over EUR 200 billion annually, representing the second largest state aid according to the 2016 SA Scoreboard.[49] In 2018, the Clean Energy for All Europeans Package[50] was introduced, followed by the revision of the Climate and Energy Framework 2020-2030 targets and the legislative activities on Governance of Energy Union[51] in November 2018. The new

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[45] Commission, 'Energy Union Package, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank, A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy' COM(2015) 80 Final <https://eur-lex.europa.eu/resource.html?uri=cellar:1bd46c90-bdd4-11e4-bbe1-01aa75ed71a1.0001.03/DOC_1&format=PDF> accessed 18 July 2019.

[46] Council Regulation (EU) 2015/1588 of 13 July 2015 on the Application of Articles 107 and 108 of the Treaty on the Functioning of the European Union to Certain Categories of Horizontal State Aid (Text with EEA Relevance) [2015] OJ L248/1 <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32015R1588> accessed 20 May 2019.

[47] UNFCCC, 'Paris Agreement: Essential Elements' (22 October 2018) <https://unfccc.int/process-and-meetings/the-paris-agreement/d2hhdC1pcy> accessed 1 July 2019.

[48] ibid.

[49] Leigh Hancher, 'Can the Treaty State Aid Regime Come to the Rescue of Climate Change?' (2017) 16 European State Aid Law Quarterly 1, 1.

[50] Commission, 'Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank, Clean Energy for All Europeans' COM(2016) 860 Final <https://eur-lex.europa.eu/resource.html?uri=cellar:fa6ea15b-b7b0-11e6-9e3c-01aa75ed71a1.0001.02/DOC_1&format=PDF> accessed 12 August 2019.

[51] European Parliament, 'Position of the European Parliament Adopted at First Reading on 13 November 2018 with a View to the Adoption of Regulation (EU) 2018/... of the European Parliament and of the Council on the Governance of the Energy Union and Climate Action, Amending Directive 94/22/EC, Directive 98/70/EC, Directive 2009/31/EC, Regulation (EC) No 663/2009, Regulation (EC) No 715/2009, Directive 2009/73/EC, Council Directive 2009/119/EC, Directive 2010/31/EU, Directive 2012/27/EU, Directive 2013/30/EU and Council Directive (EU) 2015/652 and Repealing Regulation (EU) No 525/2013', P8_TA-PROV(2018)0443 <http://www.europarl.europa.eu/doceo/document/TA-8-2018-0443_EN.pdf> accessed 22 August 2019.

targets to be achieved by 2030[52] are at least 40% cuts in greenhouse gas emissions (from 1990 levels), a share of at least 32% for renewable energy, and an improvement of at least 32.5% in energy efficiency. At the same time, the new Renewable Energy Directive (RED 2018)[53] was adopted but its implementation in national legislations is not envisaged until June 2021. In 2018, the IPCC published its Special Report, too. The second decade of the 21st century ends with the European Green Deal,[54] representing the roadmap,[55] with actions envisaging European Climate Law, the European Industrial Strategy, the European Green Deal Investment Plan and the Just Transition Mechanism.[56] In order to complement these efforts, the Commission also decided to undertake the state aid fitness check, thus extending the application of GBER 2014 and EEAG 2014-2020 to 2022.

The chronology of EU policy developments and the adoption of binding documents in the areas of environment, energy and state aid clearly show the interaction of the climate change prevention efforts in the EU's climate policy and, consequently, energy policy and state aid policy and law. The periods for the implementation of the EU Climate and Energy Framework since 2007 attempt to correspond to the commitment periods determined by the Kyoto Protocol and Paris Agreement. It is the same situation with the calculated percentages of necessary gas emission reductions. It can also be seen that the EU initially reacted to its international commitments related to the environmental and climate policy through interventions in energy policy. However, it can be argued that the climate policy was not the main reason for interventions in energy policy, but rather the effort to achieve a common energy market, to reduce monopolies, mostly in electricity generation, and to improve competition and

[52] Commission, '2030 Climate and Energy Framework' <https://ec.europa.eu/clima/policies/strategies/2030_en#tab-0-0> accessed 7 January 2019.

[53] Commission, Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast) (Text with EEA relevance) [2018] OJ L328/82 <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L2001&from=EN> accessed 1 May 2020.

[54] Commission, 'Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions. The European Green Deal' COM(2019) 640 final <https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0002.02/DOC_1&format=PDF> accessed 9 May 2020.

[55] Commission, 'Annex to the Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions. The European Green Deal' COM(2019) 640 final Annex <https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0002.02/DOC_2&format=PDF> accessed 9 May 2020.

[56] More at: https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en accessed 9 May 2020.

consumer protection. It seems that for the Commission, energy, competition and technological development policies were the medium used to introduce climate policy at higher levels of decision-making as a 'win-win' scenario. Such a situation, combined with technological developments in renewable energy and the intentions to create a common energy market, provided a vibrant policy playing field in the EU. The other side of the coin was the public support that the Commission gained for its reforms in the energy sector; however, this was not due to the wider public's understanding of the need for the proposed energy packages, but because of the climate change prevention aspect which was much closer to the ordinary EU citizen. In order to satisfy both aims, the Commission had to provide financial support and allow the same to the Member States. However, this required adaptation of the state aid framework through the State Aid Action Plan in 2005 and State Aid Modernisation in 2012. These efforts continue through the Common State Aid Action Plan 2018-2022[57] aiming at the further reassessment of a number of state aid regulations, directives and guidelines, including GBER 2014 and EEAG 2014-2020 and the extension of their application by 2022. This activity, known as the 'state aid fitness check', corresponds with the timing of the next benchmark for assessing the Climate and Energy Framework targets in 2023.

4 The TFEU 'energy chapter': a legal base that opened the way towards an EU energy policy

The Preamble of the TFEU signed by the Member States in the third statement affirms 'as the essential objective of their efforts the constant improvements of the living and working conditions of their peoples'. If the IPCC Special Report 2018 findings are taken seriously, then striving to achieve this 'essential objective' is ultimately related to the results of climate change mitigation. Deterioration of the environmental conditions as predicted by the IPCC will have a direct negative impact in the next 20 to 30 years on the living and working conditions of the population in Europe. This wording describes 'the constant improvements of the living and working conditions' as 'the essential objective of their efforts', thus providing environmental issues with stronger leverage due to the gravity of the problem compared to other objectives. This wording relates to the wording in the TEU 'to attain the objectives they have in common'. The objectives understood as general guiding ideas of European integration and for the functioning of the EU institutions are predetermined in the

[57] Commission, 'Common State Aid Action Plan 2018-2022 Strengthening Member States' Administrative Capacity for the Management of the ESIF in the Field of State Aid' Ref Ares(2018)2381918 - 04/05/2018' <https://ec.europa.eu/regional_policy/sources/how/improving-investment/state-aid/stateaid_plan2018.pdf> accessed 13 August 2018.

legal texts of the Treaties. However, some objectives are subject to EU policies developed after the Treaties were signed in response to pressing circumstances such as the Climate and Energy Policy. After all, the legal acts deriving from these policies are part of the acquis. The implementation of such policies requires a coordinated approach. It also requires enormous financial resources to reform the energy sector in the EU towards the net zero emissions goal, thus supporting the global climate change mitigation efforts. Member States and the private sector are the first to rely on in this process. However, state aid law remains a potential threat to every renewable energy investment or production support scheme of significant scale. Then, if the Member State activities in this respect are subject to strict state aid scrutiny, are there any 'certain areas' where the Union can 'support, coordinate or supplement' their actions? The Union's exclusive competences, such as competition rules, marine biological resources and common commercial policy, are written in Article 3(1) and those under shared competences, such as the internal market, environment and energy, are described in Article 4(2). Moreover, Article 11 explicitly states that 'Environmental protection requirements must be integrated into the definition and implementation of the Union's policies and activities, in particular with a view to promoting sustainable development'.

Unlike competition rules, environment falls into the shared competences whose objectives are set out in Article 191(1),[58] including '[…] measures at international level to deal with regional or worldwide environmental problems, and in particular combating climate change'. Furthermore, paragraph (3) requires that:

In preparing its policy on the environment, the Union shall take account of:

- available scientific and technical data;[59]
- environmental conditions in the various regions of the Union;
- the potential benefits and costs of action or lack of action;

[58] 1. Union policy on the environment shall contribute to pursuit of the following objectives:

– preserving, protecting and improving the quality of the environment;

– protecting human health;

– prudent and rational utilization of natural resources;

– promoting measures at international level to deal with regional or worldwide environmental problems, and in particular combating climate change.

[59] The mentioned scientific and technical data are the result of scientific research and technical and technological innovations. Articles 179 to 182 define the objectives of strengthening the Union scientific and technological bases, including demonstration programmes, by promoting cooperation with and between undertakings, research centres and universities.

– the economic and social development of the Union as a whole and the balanced development of its regions.

Further on, Article 192 describes the decision-making procedure for the implementation of the environmental objectives:

The European Parliament and the Council, acting in accordance with the ordinary legislative procedure and after consulting the Economic and Social Committee and the Committee of the Regions, shall decide what action is to be taken by the Union in order to achieve the objectives referred to in Article 191.

However, in the case of 'measures significantly affecting a Member State's choice between different energy sources and the general structure of its energy supply' the Council acts unanimously in accordance with a special legislative procedure. Nevertheless, if a measure involves costs deemed disproportionate for the public authorities, a Member State can ask for temporary derogations, and/or financial support from the Cohesion Fund. This opens the way for bargaining before the Council and shows how energy supply and the right to choose the energy mix are important to Member States, which is one of the key reasons for balancing between climate change and energy supply issues.

The aims and procedures in regard to energy issues are further elaborated in Article 194, or the so-called 'Energy Title'. The first paragraph clearly relates 'the context of the establishment and functioning of the internal market' with 'the need to preserve and improve the environment'. In this respect, it declares that:

Union policy on energy shall aim, in a spirit of solidarity between Member States, to:

(a) ensure the functioning of the energy market;

(b) ensure security of energy supply in the Union;

(c) promote energy efficiency and energy saving and the development of new and renewable forms of energy; and

(d) promote the interconnection of energy networks.

The measures necessary to achieve these objectives are subject to the ordinary legislative procedure but '[…] shall not affect a Member State's right to determine the conditions for exploiting its energy resources, its choice between different energy sources and the general structure of its energy supply […]'. However, measures primarily of a fiscal nature are subject to a special legislative procedure and are made unanimously in the Council. In this article, we can find again that the functioning of the internal market is subsequent to the 'need to preserve and improve

the environment' while the Union's policy on energy calls on the 'spirit of solidarity' to achieve the aims declared in points a) to d).

5 'Energy packages' as a precondition for energy reform aiming at climate change mitigation

Moussis[60] has described the EU Community energy policy as having two wings. One being the internal energy market and the other security of energy supply. Security of energy supply represents the ultimate goal of the EU energy policy while the internal energy market is the outcome of the EU competition policy. Interaction between these two policies is necessary for the achievement of the goals set by the EU treaties as it is necessary for two wings to move in harmony in order to allow the bird to fly. In the context of the European Union, as Jakovac writes, 'this implies creating an efficient and cost-effective electricity sector followed by a fully opened, competitive and interest-balanced market structure'.[61]

Since 1996 there have been activities aimed at harmonisation and liberalisation of the EU's internal electricity market to address market access and regulation, consumer protection, interconnection and security of supply. These activities also included natural gas markets in the first three packages, but the focus was on electricity generation which was monopolised by EU Member State public companies until the end of the 1990s. Raising the importance of competition policy and the needs for more energy, and especially electric energy, easily available across the borders of the Member States initiated a process of four successive energy policy reform packages.

The First Energy Package, adopted in 1996, dealt with electricity, and was transposed into the Member States' legal systems by 1998. The Second Energy Package, adopted in 2003, was transposed into national law by Member States by 2004. The Third Energy Package of April 2009 amended the previous package and set the base for a functioning internal market on electricity. Finally, the fourth package, which dealt only with electricity and was inspired by climate change and energy issues, was adopted as the 'Clean Energy for all Europeans'[62] package in 2016 and was translated into three regulations and one directive in 2018. This package 'aims to implement the Energy Union and covers energy efficiency, renewable energy, the design of the electricity market, securi-

[60] Nicholas Moussis, *Access to European Union: Law, Economics, Policies* (16th edn, European Study Service 2007) 399-409.

[61] Pavle Jakovac, 'Electricity Directives and Evolution of the EU Internal Electricity Market' (2012) 21 Ekonomska misao i praksa [Economic Thought and Practice] 315, 316.

[62] Commission, 'Clean Energy for All Europeans' (n 50).

ty of electricity supply and governance rules for the Energy Union',[63] as presented by the European Parliament.

Although continuous interaction is evident between the science in energy technology, law and the economy on one hand, and policymaking in the EU institutions on the other, there is serious criticism that the implementation of the policies and transposed legislation is not always harmonised. Moussis, while recognising the importance of state aid law, questions the Member States' attempts to use the 'security of supply' and 'diversity of energy situation' as an 'excuse for the preservation of their national monopolies and of their different regulatory frameworks'.[64] On the other hand, Anatole Boute[65] raises concerns about the impact of the unbundling provisions on foreign investments in energy and third-party access to EU interconnection capacities, but especially challenges the withdrawal of support to renewable energy that 'jeopardized the credibility of renewable energy policies and generated high levels of investment uncertainty'.[66]

The first Electricity Directive (96/92/EC2) as the 'electricity part' of the First Energy Package required the legal unbundling of previously vertically integrated monopolistic companies and the creation of new market participants, such as transmission and distribution system operators, as non-competitive parts of the public electricity management infrastructure to be completed by February 1999. From the state aid law perspective, the new models of state interventions in the energy system and the nature of the transmission and distribution system operators and their attributability to the state came under focus at the time.

A further update of the initial directives on electricity and gas known as the Second Energy Package of 2003 focused on the development of market access and was expected to be transposed into national law by Member States by 1 July 2004, with some provisions entering into force later on, in 2007. Electricity was covered by Directive 2003/54/EC.[67] Again, state aid issues became interesting in relation to the nature of the independent regulatory body or independent system operator. Finally, EU climate and energy policy, supporting progressive RES power plant

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[63] Gouardères (n 20) 2

[64] Moussis (n 60) 399.

[65] Anatole Boute, 'Energy Trade and Investment Law: International Limits to EU Energy Law and Policy' in Martha Roggenkamp and others (eds), *Energy Law in Europe: National, EU and International Regulation* (3rd edn, OUP 2016) 155-157.

[66] ibid, 161.

[67] Directive 2003/54/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in electricity and repealing Directive 96/92/EC [2003] OJ L176/37.

electricity generation, raised state aid issues but ended in landmark case law such as *PrussenElektra*.

The Third Energy Package of 2009, only two years after the enforcement of the most demanding provisions of the previous package, was adopted with the aim of further liberalising and integrating energy markets in the EU. The electricity part of the package covered unbundling energy suppliers from network operators and strengthening the independence of regulators. As a result, three new documents were adopted by the Commission and the Parliament.[68] The consequence was that a number of countries had to change their legislation and schemes of support, including aid for electricity generation from RES, which once again raised certain state aid concerns.

The Commission Communication 'Clean Energy for All Europeans' of November 2016 clearly relates this energy reform package to the establishment of the Energy Union supported by the Investment Plan for Europe. This package of reforms deals only with electricity and aims to address new challenges related to demand response, renewable electricity generation and decentralised generation or so-called 'energy communities and prosumers'. Its final aim is to make the average carbon intensity of the EU's economy 43% lower in 2030 than in 2016, with renewable electricity representing about half of the EU's electricity generation mix. The Communication recalls the Paris Agreement and relates it with the EU energy policy by stating that 'the implementation of the EU's ambitious Paris climate change commitments is now the priority and depends to a large extent on the successful transition to a clean energy system as two thirds of greenhouse gas emissions result from energy production and use'.[69]

Moreover, it identifies three main goals to be achieved: energy efficiency; achieving global leadership in renewable energies; and providing a fair deal for consumers. The Annex to the Communication titled 'Accelerating clean energy in buildings'[70] deals with energy efficiency first. In

[68] Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC [2009] OJ L211/29; Regulation (EC) No 714/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity [2009] OJ L211/15; and Regulation (EC) No 713/2009 of the European Parliament and of the Council of 13 July 2009 establishing an Agency for the Cooperation of Energy Regulators [2009] OJ L211/1.

[69] Commission, 'Clean Energy for All Europeans' (n 50) 3.

[70] Commission, 'ANNEX Accelerating Clean Energy in Buildings to the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank, Clean Energy for All Europeans' COM(2016) 860 Final <https://eur-lex.europa.eu/resource.html?uri=cellar:fa6ea15b-b7b0-11e6-9e3c-01aa75ed71a1.0001.02/DOC_2&format=PDF>

addition, Annex 2 named 'Action to boost the clean energy transition'[71] provides an analysis of the integration of the 'package' into other EU policies and initiatives. Political agreement on the package, which is also known as the Winter Energy Package, was reached in December 2018; it contains three regulations and one directive.[72] It remains to be seen to what extent the envisaged benefits of this package will be in compliance with the competition policy and state aid regulations that are about to undergo a fitness check by the end of 2022.

6 Reality check: financial aspect of energy transition versus data on climate mitigation achievements

A crucial element for the implementation of energy and climate policy in the EU is the financial resources available at EU and Member State level. The best way to undertake a reality check on policy implementation is to put the financial estimates face to face with the latest data on climate mitigation achievements. From the very beginning of renewable energy development, the Commission has been involved in a continuous process of financial assessment of the costs necessary to achieve the overall Community objective of RES penetration, but, it has also weighted such costs against the estimated benefits related to energy transition towards a low carbon economy.

The estimations of the necessary financial resources for the implementation of the EU energy and climate policy changed from 1997 in each of the successive policy documents. This is not surprising as there were continuous updates to climate and energy policies through the new ideas and new priorities based on new technological developments related to technical requirements and scientific findings. The White Paper for

accessed 12 August 2019.

[71] Commission, 'ANNEX Action to Boost the Clean Energy Transition to the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank, Clean Energy for All Europeans' COM(2016) 860 Final <https://eur-lex.europa.eu/resource.html?uri=cellar:fa6ea15b-b7b0-11e6-9e3c-01aa75ed71a1.0001.02/DOC_3&format=PDF> accessed 12 August 2019.

[72] Regulations and Directive related to the 'Clean Energy for All Europeans' Package published in OJ L158 are: Regulation (EU) 2019/941 of the European Parliament and of the Council of 5 June 2019 on risk-preparedness in the electricity sector and repealing Directive 2005/89/EC; Regulation (EU) 2019/942 of the European Parliament and of the Council of 5 June 2019 establishing a European Union Agency for the Cooperation of Energy Regulators; Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity, and Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU (entered into force on 4 July 2019 to be transposed into national legislation by 31 December 2020)

a Community Strategy and Action Plan[73] of 1997 estimated the investment costs required to achieve the doubling of the market penetration of renewable energies by 2010 at ECU 165 billion for capital investments for the period 1997-2010.[74] Considering the possible ways to promote the development of renewable energy sources, the White Paper relies on competition policy and the principle of state aid balancing where the beneficial effects of such measures on the environment must outweigh the distorting effects on competition.[75] This principle established at the very beginning can be read in support of contemporary challenges.

The Green Paper 'Towards a European strategy for the security of energy supply'[76] of 2000 reconfirms the estimates made in 1997. The Commission expected at the time that RES development could reach EUR 165 billion by 2010,[77] but also expressed dissatisfaction with the limited results of the programmes developing RES with modest financial resources[78] and called for more Community investments. Seven years later, in a 2007 Commission document 'An Energy Policy for Europe',[79] a braver view was presented. Based on estimates that the EU electricity

[73] Commission, 'White Paper Energy for the Future – Strategy and Action Plan' (n 22) 11.

[74] 'The Commission justifies this amount with the prediction that the doubling of the share of renewables may require an increase of approximately 30% in the total energy sector investment but it could create an estimated gross figure of 500 000 - 900,000 new jobs, save annually (in 2010) 3 billion ECU in fuel costs and a total of 21 billion ECU for the period 1997-2010'. Commission, White Paper (n 22) 11.

[75] 'When authorizing State Aids, the Commission has to take into account the derogations laid down in Article 92 of the Treaty. The guiding principle for the Commission in assessing aid for renewable energies, contained in the Community Guidelines on State Aid for Environmental Protection, is that the beneficial effects of such measures on the environment must outweigh the distorting effects on competition. The Commission will consider appropriate modifications in favour of renewable energies in support of its policy in this area during the revision of the present guidelines taking into consideration the Council's Resolution on the Green Paper 'Energy for the future: renewable sources of energy' which states that investment aid for renewables can, in appropriate cases, be authorized even when they exceed the general levels of aid laid down in those guidelines'. Commission, White Paper (n 22) 13-14.

[76] Commission, 'Green Paper Energy Supply 2000' (n 23).

[77] 'The target of doubling the share of renewables forms part of a strategy of security of supply and sustainable development. It needs a major effort, however. The investment needed to achieve this target has been estimated by the Commission at EUR 165 billion between 1997 and 2010. A particularly big effort will have to be made in the electricity sector to achieve the target set out in the proposal for a directive on electricity produced from renewable sources of 24% of green electricity in 2010 as compared with 12% now'. Commission, Green Paper (n 23) 48.

[78] 'The annual budgets for 2001 and 2002 are envisaged to be EUR 14.0 and EUR 11.0 million for SAVE and EUR 17.5 and EUR 17.3 million for ALTENER. These are very modest amounts which do not amount to a real Community policy. Experience with SAVE and ALTENER has shown that limited results have been obtained with the exception of selective measures'. Commission, Green Paper (n 23) 65.

[79] Commission, 'An Energy Policy for Europe' (n 30).

demand was rising by some 1.5% per year, the Commission warned that 'investment in generation alone over the next 25 years will be necessary in the order of EUR 900 billion'.[80] Moreover, analysis of the adequacy of electricity generation and gas supply capacity showed the need for EUR 150 billion of investment in gas-fired power plants and an additional EUR 220 billion in gas infrastructure since electricity generation was expected to be heavily dependent on gas with an import dependence of 90% in 2030.[81]

Energy 2020, a strategy for competitive, sustainable and secure energy[82] adopted in 2010, increased further the estimation of the financial resources needed to achieve the EU energy and climate framework to around EUR 1 trillion by 2020.[83] Moreover, in the 2012 'Renewable Energy: A Major Player in the European Energy Market Communication', the Commission proposed an energy infrastructure package of priority energy infrastructure corridors, estimating about EUR100 billion for new electricity transmission lines alone.[84] Two years later, in 'A Policy Framework for Climate and Energy in the Period from 2020 to 2030',[85] the Commission proposed additional financial interventions for investments in RES developments.[86]

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[80] ibid, 4.

[81] ibid, 9.

[82] Commission, Energy 2020 (n 36).

[83] 'Over the next ten years, energy investments in the order of EUR 1 trillion are needed, both to diversify existing resources and replace equipment and to cater for challenging and changing energy requirements. Structural changes in energy supply, partly resulting from changes in indigenous production, oblige European economies to choose among energy products and infrastructures. These choices will be felt over the next 30 years and more. To enable these decisions to be taken urgently calls for an ambitious policy framework. Postponing these decisions will have immeasurable repercussions on society as regards both longer-term costs and security'. Commission, Energy 2020 (n 36) 2.

[84] Commission, Renewable Energy: A Major Player in the European Energy Market (n 37) 8.

[85] Commission, 'Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A Policy Framework for Climate and Energy in the Period from 2020 to 2030' COM(2014)15 Final/2.

[86] 'Under the 2020 Framework, the Strategic Energy Technology Plan (SET Plan) has increased R&D investments across the Union from EUR 3.2 to EUR 5.4 billion per year and is progressing towards a single, integrated roadmap to guide future investments. For the 2014-2020 period, the Union is ramping up investment in energy and climate related research and development and under Horizon 2020, the new Union research and innovation programme, close to EUR6 billion will be dedicated to energy efficiency and to secure, clean and low carbon technologies and to smart cities and communities. Increased funds will also be available for financial instruments, public private partnerships and SME projects'. Commission, Climate and Energy Framework 2020-2030 (n 85) 17.

The Energy Union Package[87] of 2015 estimated that EUR 200 billion annually would be needed in the next decade for investments in generation, networks and energy efficiency. The package was based on the prediction that the private sector would bear much of the cost but also admits that access to financing would be of key importance for successful energy transition towards a low carbon economy under free market competition.[88] A year later, the document 'Clean Energy for All Europeans'[89] increased the estimates to EUR 379 billion needed annually over the 2020-2030 period in order to reach the EU's 2030 climate and energy targets. This sum was targeted to investments in energy efficiency, renewable energy sources and infrastructure, in combination with EUR 27 billion per year devoted to public and private research, and development and innovation in Energy Union related areas.

The European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy of 2018 named 'A Clean Planet for All'[90] estimates that around EUR 520-575 billion annually will be needed to achieve a net-zero greenhouse gas economy[91] representing 2.8% of EU GDP compared to 2% of GDP in 2018. Great expectation was placed on Juncker's plan and cohesion policy funds in this respect.[92] The Commission indicated that 'The EU is spending about 20% (over EUR 206 billion) of its overall budget in 2014-2020 to climate change-related

[87] Commission, 'Energy Union Package' (n 45).

[88] 'Today, the European Investment Bank, the Connecting Europe Facility and financing under the European Structural and Investment Funds already provide the means. Moreover, the proposed European Fund for Strategic Investments will provide additional support, hence, further facilitating access to finance for projects of European significance such as in energy networks, renewable energy and energy efficiency. The Commission will explore proposals for energy investment regimes that pool resources to finance economically viable investments, avoiding market distortion and fragmentation'. Commission, 'Energy Union Package' (n 45) 8.

[89] Commission, 'Clean Energy for All Europeans' (n 50) 4.

[90] Commission, 'A Clean Planet for All' COM(2018) 773 final.

[91] 'Today around 2% of GDP is invested in our energy system and related infrastructure. This would have to increase to 2.8% (or around EUR 520-575 billion annually) in order to achieve a net-zero greenhouse gas economy. This means considerable additional investments compared to the baseline, in the range of EUR 175 to 290 billion a year. This is also in line with the IPCC special report that estimated that between 2016 and 2035 investments are needed in the energy system representing about 2.5% of world GDP. However, certain options such as a rapid transformation towards circular economy and behavioural changes have the potential to reduce the need for additional investment'. Commission, 'A Clean Planet for All' (n 90) 16.

[92] 'Environment, resource and energy efficiency are already very prominent sectors of the Investment Plan for Europe – the Juncker Plan – a pillar of which has been the European Fund for Strategic Investment (EFSI) and the EU cohesion policy funds through which the EU provides ca. EUR 70 billion for the implementation of the Energy Union Strategy'. Commission, 'A Clean Planet for All' (n 90) 17.

action. The Commission proposed to raise this share to 25% for the period 2021-2027'.[93]

The outcome of the all the previous financial appropriations was that the 'Final energy consumption in the 28 EU Member States was 5.7% lower in 2017 than in 2005, mainly due to reductions in the industry sector'.[94] Moreover, EEA findings warned that in 2017, the EU's final energy consumption rose for the first time in seven years above the indicative trajectory. Most importantly, energy consumption in the industry sector fell at an annual average rate of 1.3% between 2005 and 2017, but as a result of a shift towards less energy-intensive industries and a more service-oriented European economy. At the same time, energy consumption in the growing services sector increased annually by 0.6% on average due to the fact that the energy demand from electrical appliance heating and air conditioning was increasing. This is why electricity consumption in the services sector also increased by 14.5% from 2005, while over the same period electricity consumption in industry decreased by 8.4%, because of the reduced activity in the sector and increased energy savings. Where the impact of renewable electricity generation on the global climate mitigation aim is concerned, the IEA finds that renewable power needs to expand significantly to meet the 2030 targets.[95] The Renewable Electricity Capacity Additions, 2007-2021, updated IEA forecast,[96] provide a valuable insight. Data show that China has had the biggest growth of renewable electricity capacity additions since 2013, while, between 2007 and 2012, it had almost the same figures as the EU. In 2019, China had $^{1}/_{3}$ of the world renewable electricity capacity additions, or 65.3 GW, and the IEA forecasts an increase of this share in the next two years. The biggest growth of the EU renewable electricity capacity additions was in 2011 (40.2 GW) and 2012 (37.8 GW); however, it decreased afterwards to 33.9 GW in 2019, with this trend due to decrease further according to the IEA forecast. Since 2018, the rest of the world, excluding China, India, Japan, Brazil and the US, are building more renewable electricity capacity additions than the EU. In the IEA

[93] Data taken from the official EC documents available at <http://europa.eu/rapid/press-release_MEMO-18-6545_en.htm> accessed 1 September 2019.

[94] According to EEA (n 9).

[95] 'Renewable power needs to expand significantly to meet the IEA Sustainable Development Scenario share of half of generation by 2030. In 2018, renewable electricity generation rose 7%, with wind and solar PV technologies together accounting for 60% of this increase. Although the share of renewables in global electricity generation reached 26% in 2018, renewable power as a whole still needs to expand significantly to meet the Sustainable Development Scenario share of half of generation by 2030. This requires the rate of annual capacity additions to accelerate; however, renewable capacity growth stalled in 2018 for the first time since 2001'. IEA (n 9).

[96] ibid.

forecast for 2020 and 2021, the US will have almost the same growth in renewable electricity capacity additions as the EU, while India will reach 50% of that amount. Future developments in renewable energy generation would have a direct impact on the reduction of GHG emissions.

The Climate Action Tracker confirms the consistency of the EU climate change efforts but questions their real impact since the EU is the third-largest emitter of CO_2 behind China and the US, arguing that 'such a target would just place the bloc in range of a 2 degrees C-compatible reduction',[97] while China, ironically, is on course to meet its low-set Paris targets. When talking about consistency, we should remember that all EU climate policy documents actually focus primarily on a 2 degrees C-compatible reduction. The IEA reports on global CO_2 emissions even deepen the confusion, stating that, in 2019, the US 'saw the largest decline in energy-related CO_2 emissions'.[98] The EU decreased energy-related CO_2 emissions by 5%, which is the result of increasing renewables and switching from coal to gas,[99] while China and Japan benefited in this respect from new nuclear reactors.

With all these figures in mind, an understanding of what being the 'green leader' means could be difficult to agree on. The EU is consistent in its attempts to meet the Paris Agreement commitments. Until now, the EU has succeeded in meeting its own targets, although with numerous difficulties. However, it could be argued that the EU has achieved those targets at the expense of its own economy, downscaling industry and manufacturing, and growing the services sector while still being heavily dependent on gas and oil imports for transport, heating and even electricity generation from gas plants that have replaced the old coal power plants. The EU economy is based on common interest, ultimately represented by the internal market with undistorted competition. The question is whether it is time for the EU to reconsider the understanding of 'common interest' by putting more weight on climate change mitigation at the expense of certain elements of competition policy, such as investment and operating state aid for renewable electricity generation, as well as state aid for energy efficiency. The first two elements are to ensure investors' security in the energy sector where demand for electricity is supposed to increase six-fold by the end of the century. The third ele-

[97] Kieran Mulvaney 'Climate Change Report Card: These Countries Are Reaching Targets'. National Geographic 19 September 2019 available at: <www.nationalgeographic.com/environment/2019/09/climate-change-report-card-co2-emissions/> accessed 1 June 2020.

[98] International Energy Agency, 'Global CO2 Emissions in 2019' available at <www.iea.org/articles/global-co2-emissions-in-2019> accessed 20 February 2020.

[99] 'Output from the European Union's coal-fired power plants dropped by more than 25% in 2019, while gas-fired generation increased by close to 15% to overtake coal for the first time'. IEA (n 98).

ment is due to the fact that an energy-efficient EU could save up to 30% of currently spent energy, thus reducing the burden of rapidly increasing renewable electricity generation that current technology can hardly cope with. A more supportive state aid framework for RES energy could be of key importance for the continuation of the EU climate change mitigation efforts.

7 State aid framework supportive to climate change mitigation

Analysis of the current state aid framework and possible future changes, which should be supportive to climate change mitigation in the next decade, is focused on three documents: first, the General Block Exemption Regulation 2014; second, the Renewable Energy Directive 2018; and third, Environment and Energy Guidelines 2014-2020. A brief presentation of their purpose and deficiencies will be presented in comparison with the available empirical data showing their real impact on climate change mitigation in the EU.

7.1 General Block Exemption Regulation

This Regulation is directly applicable in all Member States and was supposed to be binding in its entirety until 31 December 2020, but its application has been extended until the end of 2022. The scope of the GBER regulation limits its application to certain categories of aid, although it is considered a 'cornerstone' of state aid modernisation. This Regulation exempts Member States from the notification obligation, as long as all the criteria are fulfilled. It simplifies the award of state aid and reduces the duration of processes for aid beneficiaries. GBER also introduces ex-post requirements for Member States, such as the requirement to evaluate large aid schemes. The Regulation sets the conditions for exemption, subject to the fulfilment of all the general conditions from Chapter I and the specific conditions from Chapter III GBER. Aid that complies with both general and specific conditions 'shall be compatible with the internal market within the meaning of Article 107(2) or (3) of the Treaty and shall be exempted from the notification requirement of Article 108(3) of the Treaty'. It deals, to a large extent, with the environmental aid categories, including investment and operating aid for electricity from renewable sources, energy infrastructures, and energy efficiency, as well as for heating/cooling and transport based on green energy. In order to limit distortions of competition through state aid measures, the Commission has developed safeguard mechanisms, such as the evaluation and monitoring of schemes of over EUR 150 million annually, while all aid below this threshold has to comply with two main principles: transparency and the incentive effect subject to different aid limits and aid intensities.

Since 2014, GBER has served its purpose, but some changes reflecting new policies and technological developments expected for the period 2022-2030 should be considered. However, some concerns have been raised over its aims and the leeway left to the Member States for granting tax relief. Jerónimo Maillo argues that 'State aid control on environmental tax reliefs requires a balance between different goals and values [...]'.[100]

The State Aid Scoreboard for 2018[101] shows figures representing the use of GBER mechanisms for the period 2014-2017. Aid for industrial research received EUR 5.176 billion or 5.3% of all aid provided under GBER. Similarly, aid for experimental development reached EUR 6.281 billion or 6.4% of all aid provided under GBER. Data show that these activities were in serious need of state aid.[102] Investment aid enabling undertakings to go beyond Union standards for environmental protection or to increase the level of environmental protection in the absence of Union standards made up 1.1% of total GBER aid during the same period or EUR 1.99 billion. At the same time, aid for early adaptation to future Union standards for SMEs was only 0.5% of total GBER aid or EUR 508 million. If the fight against time concerning climate change mitigation is really an EU priority, then early adaptation should require an increase of aid intensity and encourage SMEs and Member States to invest more in those measures. Environmental aid for energy efficiency measures makes up only 0.9% of GBER aid with only EUR 843 million, and, together with EUR 97 million for energy efficiency projects, it reached altogether 1% of all aid provided under GBER. If we are to look more specifically at aid amounts for RES, we come to surprising data. Investment aid for the promotion of energy from RES covers 1.3% of aid provided through GBER, or EUR 1.302 billion, where not all of it is for electricity installations. Moreover, operating aid for the promotion of energy from RES under Article 42, which applies to large companies, too, under the competitive bidding process, is EUR 6 million, while for small-scale installations it reaches EUR 12 million but is insufficient to be represented as a percentage of aid provided under GBER for the period 2014-2017. However, aid in the form of reductions in environmental taxes under Article 44 represents 32.1% of total GBER aid, with EUR 31.274

[100] Jerónimo Maillo, 'Balancing Environmental Protection Competitiveness and Competition: A Critical Assessment of the GBER and the EEAG' (2017) 16 European State Aid Law Quarterly 1, 4.

[101] Commission, State Aid Scoreboard 2018. Results, trends and observations regarding EU28 State Aid expenditure reports for 2017, COMP.A3 Brussels, 7 January 2019, 29 available at <https://ec.europa.eu/competition/state_aid/scoreboard/state_aid_scoreboard_2018.pdf> accessed 15 March 2020.

[102] There are no data regarding the share of research and experimental developments related to new and innovative RES electricity generation.

billion provided under GBER by 2018. As a consequence of the current GBER application, the smallest amounts are provided for early adaptation to future Union standards and adaptation beyond these standards in environmental protection, along with environmental aid for energy efficiency measures and projects altogether reaching 2.6%. Total investment aid for the promotion of energy from RES and operating aid for the promotion of energy from RES hardly reach 1.4% of aid provided under GBER. Industrial research and experimental development cover 11.7%, while aid in the form of the reduction of environmental taxes represents $^{1}/_{3}$ of aid provided under GBER for the period 2014-2017, which is 20 times more than the sum of support provided to investment and operating aid for RES promotion. Maillo provides cautious justification for this practice regarding energy intensive users that face strong non-EU competitors since 'otherwise the Member States would not establish an environmental tax or would fix it at a much lower rate, a scenario which may be much worse for environmental protection'.[103] He also argues from a different perspective that environmental aid 'can be more beneficial, in practice, to operators who use more environmentally friendly techniques than traditional ones and could thus indirectly increase their competitiveness […]'.[104] The need for balance between different goals and values is clear from the 2018 State Aid Scoreboard data, showing that the EU and its Member States should soon decide on their priorities. A difficult choice to make – investing more in renewable energy generation for the purpose of climate change mitigation or saving their own competitiveness. Leigh Hancer also argues that although 'aid is targeted at the promotion of renewable energy […] it is but a fraction of the public support for fossil fuels across the EU'.[105] At the moment, data show that GBER is saving incumbent technologies and intensive user industries more than it is contributing to the Climate and Energy Framework. This paper argues that if the Climate and Energy Framework and the Green Deal are the leading policy documents, then state aid policy will have to follow while changes to state aid law should complement common efforts towards climate change mitigation.

7.2 The 2018 Renewable Energy Directive

The revised Renewable Energy Directive 2018/2001/EU entered into force in December 2018, replacing the original of 2009, when it was found that some Member States were about to miss their national RES

[103] Maillo (n 100) 6.

[104] ibid.

[105] Hancer (n 49) 2.

energy targets.[106] The new directive establishes a binding renewable energy target of at least a 32% share of renewable energy in gross energy consumption[107] for 2030 as a part of the 'Clean Energy for All Europeans' package. Possible revision upwards could occur by 2023 in order to meet the EU emissions reduction commitments under the Paris Agreement. Moreover, the directive announces the possibility of proclaiming binding provisions regarding cooperation between Member States and with third countries, which are currently of a voluntary nature. Most of the directive is expected to be transposed into national law by Member States by 30 June 2021. The main strategic difference is that the goal is set at the EU level, unlike the original directive, where national targets were determined. Therefore, instead of 'National Renewable Energy Action Plans' required by RED 2009, the Member States are required by RED 2018 to provide 'Integrated National Energy and Climate Plans' (NECPs). They are relevant for the assessment of the Union's renewable energy target in a way that the sum of the expected contributions delivered in the individual Member States' NECPs should show the 'ambition gap'. In that case, the Commission can assist the Member States to improve their performance or correct the EU legislation for the same purpose. According to currently aggregated numbers of Member States' NECPs, the EU-wide share of RES in final energy consumption would fall below its expected target, reaching from 30.4% to 31.9%, most optimistically in 2030.[108] Since the voluntary options for support to renewable energy deployment in RED 2009 resulted in one statistical transfer, one joint project between two Member States and in just one joint support scheme between a Member State and a third country, RED 2018 has introduced additional support measures.

Therefore, the Renewable Energy Directive aims to assist the Member States to comply with the Union's commitment under the 2015 Paris Agreement on Climate Change. For the first time, a target defined at Union level has been created to provide greater flexibility for the Member States in accordance with their specific circumstances regarding capac-

[106] Stephanie Essig and others, 'Policies for CSP Deployment by Renewable Energy Cooperation in the EU', Deliverable 6.2, MUSTEC Project, September 2019, 7 available at <https://mustec.eu/node/115> accessed 1 June 2020.

[107] 'The gross final energy consumption in each Member State from renewable energy sources equals the sum of the gross final consumption in transport, heating and cooling sector and electricity. For this purpose, gas, electricity and hydrogen shall only be considered once and the contribution from wind and hydro power plants are accounted by using a normalization algorithm defined in Annex II of RES Directive 2018/2001 considering the production and capacity during the past 15 years. Notably, electricity generated by a hydropower plant with water that had previously been pumped uphill may not be counted – regardless of the electricity generation technology used for up-hill water pumping'. Essig (n 106) 16.

[108] ibid, 19.

ity to produce renewable energy. The directive tries to balance between the ambition set out in the Paris Agreement and the current technological situation, as well as the expected technological developments, through cost reductions for investments in renewable energy. In relation to state aid, RED recognises 'support schemes' as 'an effective way' for the deployment of renewable electricity but only if they do not distort the electricity markets. This is to be achieved jointly through an enabling framework comprising the enhanced use of Union funds and the support provided by the Member States.

Consequently, the Commission has committed to '[…] support the high ambition of the Member States through an enabling framework comprising the enhanced use of Union funds, including additional funds to facilitate a just transition of carbon intensive regions towards increased shares of renewable energy […]'.[109] Four priorities are determined under financial instruments:

- reducing the cost of capital for renewable energy projects;
- integrating renewable sources into the energy system, ensuring its flexibility and maintaining grid stability;
- developing a transmission and distribution grid infrastructure, intelligent networks, storage facilities and interconnections;
- enhancing regional cooperation between Member States and with the third countries.

Reducing the cost of capital for renewable energy projects is envisaged through the state aid rules, namely GBER and EEAG, using investment aid. Integrating renewable sources into the energy system, ensuring its flexibility and maintaining grid stability can be achieved to a certain extent by state aid measures through operating aid. Developing a transmission and distribution grid infrastructure, intelligent networks, storage facilities and interconnections is necessary for the future integration of RES electricity. Enhancing regional cooperation between Member States and with third countries aims for better utilisation of existing resources and faster accumulation of financial resources for future technologically determined and efficiency driven renewable energy projects. In his initial assessment of RED 2018, Hancer underlines that the 'State aid regime will have an important role to play in ensuring that such support takes the form of "good aid". But far more will be required of the Treaty toolbox in the Clean Energy Transition […]'.[110]

[109] Article 3(5).

[110] Hancer (n 49) 1.

It is still too early to give a valid opinion on the effects of RED 2018 without data to facilitate evidence-based criticism since this directive is to be transposed into national legislations by 2021. The findings from the Renewable Energy Progress Report[111] of April 2019 could be taken as a starting point. The report shows that the overall EU share of renewable energy in final energy consumption by 2020 will be between 18.1% and 20.7%. However, 11 Member States are considered likely to fail to meet their national targets by 2020. Seven Member States were considered to be well on the way to reaching national targets depending on their ability to reduce demand for energy. Nine Member States could reach national targets by 2020 if they engage in cooperation processes aiming at joint RES energy projects or support schemes. This is an area where RED 2018 could help Member States support renewable energy by establishing obligatory shares for cooperation in joint projects and joint support schemes.

Another report from IRENA[112] in 2020 also shows careful optimism while warning of a widening gap between rhetoric and action.[113] According to the findings, 'Renewable power generation is now growing faster than overall power demand […]' but its share '[…] in global final energy consumption has increased only slightly since 2010, staying around a threshold of about 10%'.[114]

In this respect, the EU figures[115] show that the share of modern renewables in total energy supply was 15% in 2017 while the planned energy scenario envisages 23% in 2030 and 33% in 2050. The transformative energy scenario requires 71% by 2050. The share of modern renewables in total energy consumption in 2017 was 17% while the planned energy scenario envisages 24% in 2030 and 34% in 2050. The transformative energy scenario requires a 70% share of modern renewables in total energy consumption by 2050. The power generation share of modern renewables in 2017 was 31% while the planned energy scenario envisages 44% in 2030 and 58% in 2050. The transformative energy scenario raises the share of RES power generation to 86% by 2050.

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111 Renewable Energy Progress Report COM (2019) 225 final, according to Essig (n 106) 12.

112 IRENA (2020) Global Renewables Outlook: Energy Transformation 2050 available at <www.irena.org/publications/2020/Apr/Global-Renewables-Outlook-2020> accessed 2 June 2020.

113 'The gap between aspiration and the reality in tackling climate change remains as significant as ever, despite mounting evidence of the harm that climate change is causing'. IRENA (2020) (n 112) 19.

114 ibid, 22.

115 All figures from IRENA (2020) (n 112) 240-241.

Under the planned energy scenario from 2016 to 2050, average annual investments in renewable energy in the EU are estimated at USD 38 billion, while the transformative energy scenario requires USD 78 billion. Consequently, power grids and system flexibility investments under the planned energy scenario from 2016 to 2050 are estimated also at USD 38 billion annually, while the transformative energy scenario envisages USD 56 billion for the same purpose. However, according to the planned energy scenario, these ranges of investments will be sufficient only if an additional USD 89 billion annually is invested in energy efficiency in buildings, including integrated renewable energy, although the transformative energy scenario estimates that USD 130 billion annually will be needed for this purpose alone.

The figures presented are empirical support for identification of the measurable targets that RED 2018 should assist Member States to achieve through all the available support measures. The reassessment of certain parts of RED 2018 in 2021, 2023, and 2025 would be valuable for timely adaptations of support measures and state aid rules in order to meet the Paris Agreement commitments. The most significant change would be if the currently voluntary support measures were to become obligatory after an assessment of the target achievement by 2022. This would mean a policy decision on whether to continue to use a 'bottom-up' approach on a voluntary basis through sporadic Member States cooperation, or a 'top-down' scenario coordinated by the Commission. Both solutions could have political consequences for the EU as well as for the further development of state aid legislation envisaged after the end of the 'fitness check' in 2022. Hancer's criticism of the Member States' inability to agree on alternative measures while suggesting a 'state aid regime' as the solution could be understood as his support for a 'top-down' approach that is necessary in the circumstances.[116] It seems that the presented figures, the IPCC findings and a part of academic criticism suggest that a global issue such as climate change mitigation dictates a 'top-down' approach due to technological and financial constraints.

7.3 Guidelines on state aid for environmental protection and energy 2014-2020

In principle, the Environment and Energy Guidelines (EEAG) elaborate, in detail, the assessment criteria based on the GBER 2014 and RED

[116] 'Given the failure to date of Member States to agree on alternative measures, the Treaty State aid regime may once again be called on to play the knight in shining armour in the increasingly urgent fight for climate change and in the realisation of the "Clean Energy Transition". Ultimately, unfair taxation and clean energy transitions come down to the same political hot potato – a fundamental re-distribution of wealth'. In Hancer (n 49) 2.

2009 provisions. First, the EEAG balance state aid against the 'common interest'. In this respect, preventing state aid from distorting competition in the internal market and affecting trade between Member States is the main aim of the Guidelines. On the other hand, they call on the Energy 2020 strategy and the 'Policy Framework for Climate and Energy in the Period from 2020 to 2030', which aim to ensure security of supply of essential resources, fight against climate change and limit the environmental impacts of the use of resources. In the delivery of this objective, the Commission suggests that Member States follow a cost-effective approach. Moreover, focus on the *ex-ante* scrutiny of cases with the 'biggest impact on the internal market' and the strengthening of cooperation with Member States in state aid enforcement is expected to contribute to climate change mitigation. The problem is that with regard to aid for energy from renewable resources, the cases with the 'biggest impact on the internal market' are also those that could matter the most in climate change mitigation. The outcome is that the trade-offs between different policies end at the expense of climate mitigation targets. In this context, Marta Villar Ezcurra writes that 'energy tax incentives are not always able to improve "environmental protection"' because 'some of them may be aimed at achieving other legitimate public policy objectives such as ensuring a competitive, sustainable and secure energy system in a well-functioning Union energy market'.[117]

Since the EEAG have been applied since 1 July 2014, the best way to present the outcome of the Guidelines used to support energy and the environment in the EU is to put them face to face with the latest available data showing whether or not the Member States are on track in four segments. The first would be progress towards the 2020 climate and energy targets in regard to GHG emissions. The second should show the progress towards the 2020 climate and energy targets in regard to final energy consumption. The third would aim to present the progress towards the 2020 climate and energy targets in regard to the share of renewables in gross final energy consumption. The fourth and final one would be to give a perspective on projected progress towards the 2030 climate targets. The methodology and data for this counterfactual analysis are taken from the European Environment Agency Report published in 2019.[118] The report shows that concerning progress towards the 2020 climate and energy targets in regard to GHG emissions, according to data

[117] Ezcurra Marta Villar, 'The Concept of "Environmental Tax" in a State Aid Context When a Fiscal Energy Measure in Concerned' (2017) 16 European State Aid Law Quarterly 1, 11.

[118] European Environment Agency, 'Trends and Projections in Europe 2019: Tracking Progress Towards Europe's Climate and Energy Targets' EEA Report No 15/19, Luxembourg: Publication Office of the European Union, 2019 available at <www.eea.europa.eu/publications/trends-and-projections-in-europe-1> accessed 1 June 2020.

from 2017, ten Member States are not on track.[119] In regard to progress towards the 2020 climate and energy targets related to final energy consumption, according to data from 2017, twelve Member States are not on track.[120] Even worse, the report finds that, between 2014 and 2017, the consumption of energy from non-renewable sources increased.[121] When it comes to progress towards the 2020 climate and energy targets in regard to the share of renewables in gross final energy consumption according to 2017 figures,[122] seven Member States are not on track.[123] Therefore, the report raises concerns over the possibility that the EU might miss its 2020 targets.[124] Projected progress towards the 2030 climate targets shows that, in 2019, only Sweden, Portugal, Greece and Malta were on track.[125] Data show that in order to achieve this target, the average RES share has to increase by around 35% more per year compared to the current average annual increase of the RES share.[126] Finally, when the EU is considered as a 'green leader', it is important to bear in mind that the renewable electricity share is about 31% of the electricity consumed in the EU in 2017.[127] One third of that total was generated by hydropower, another third by wind, and the final third by all the other technologies.[128] As state aid is a policy decision of the Member States, they

[119] ibid, 8, Figure ES.1.

[120] ibid.

[121] 'Thus, the overall trend to reduce energy consumption shifted to the detriment of the RES share and of climate mitigation efforts: since 2015, in absolute terms, the consumption of fossil fuels has increased faster than the consumption of energy from renewable sources'. EEA (n 118) 42.

[122] ibid, 8. Figure ES.1.

[123] 'A Member State is considered to be on track if its average 2017 share of energy from renewable sources matched or exceeded its 2017-2018 indicative trajectory under the RED. A Member State is considered to be not on track if its average 2017 share of energy from renewable sources was below its 2017-2018 indicative trajectory set under the RED'. EEA (n 118) 99.

[124] 'Preliminary estimates from the EEA indicate that the EU's share of renewable energy sources (RES) also continued to increase in 2018, when it reached 18.0%. The EU therefore appears to be on track to meet its 20% target for renewable energy for 2020. However, increases in final energy consumption during recent years have negatively affected the annual increase in the share of renewable energy. Continuing at the current pace of renewable energy growth and final energy consumption could put the EU at risk of slightly missing its 20% target in 2020'. EEA (n 118) 40.

[125] EEA (n 118) 10, Figure ES.3.

[126] 'To achieve this minimum level, the average RES share in the EU would need to increase by 1.1 percentage points per year from 2017 to 2030. This is more than the average increase of 0.7 percentage points per year that has been achieved since 2005'. EEA (n 118) 40.

[127] ibid, 44.

[128] 'The most important RES are hydropower (35%), wind (34%), solar photovoltaic (12%) and solid biomass (9%) (Eurostat, 2019d) (EEA, 2018c). Roughly half of renewable electricity came from variable sources such as wind and solar power (Eurostat, 2019d), representing approximately 46% of all electricity generation. In 2018, the EEA's approximated

are in a constant struggle to choose between supporting green energy for environmental reasons on the one hand, and other legitimate public policy objectives such as ensuring a sustainable and secure energy system, on the other. As long ago as 2014, Zgajewski warned that without the careful application of the guidelines, due to RES intermittency 'the current overcapacity of conventional power plants could become undercapacity in the future'.[129] The reluctance of the Member States to choose between environmental and energy priorities, combined with critiques against the inadequacy of the EEAG[130] and overly strict state aid scrutiny,[131] could be one of the reasons for the results presented in the above figures. This is certainly something that the ongoing state aid 'fitness check' should take into consideration.

8 Conclusion

Analysis of the interaction between the EU climate change objectives and state aid regulation in the area of renewable energy shows a strong link between the level of fulfilment of climate and energy targets and competition policy in the energy market which to a certain extent is determined by technology, too. The chronology of the adoption of the EU's key policy documents and related legislation describes the policy consistency of the EU's climate change legislation, presenting the 'nominal' nature of the EU's credibility as a 'green leader' compared to other players. This understanding is due to the fact that the EU policies have not had the expected effect as determined by the Kyoto Protocol and the Paris Agreement. The gap between ambition and reality raises concerns considering the time pressure dictated by climate change predictions and the scale of technology development related to the increase of renewable energy capacity deployment and the necessary infrastructure as a precondition. Such an increase in energy capacities and infrastructure to meet the 2050 targets, particularly for renewable electricity generation, requires enormous financial resources from the EU and Member States. This, however, requires interventions in competition in energy markets and more specifically the state aid framework. This reconciliation of science, the market economy and energy politics has taken a great deal of effort by the EU institutions. A key legal challenge has been to

estimates indicate that about 32% of total electricity consumed was derived from RES, with more than 48% of this share from wind (36%) and solar power (12%) (EEA (forthcoming), 2019a)'. EEA (n 118) 44.

[129] Tania Zgajewski, 'Renewables: The Great Uncertainty of the EU Energy Strategy' (Egmont Paper 71, Royal Institute for International Relations 2014) 27.

[130] Ezcurra (n 117) 11.

[131] Maillo (n 100) 6.

coordinate national energy policies while respecting the TFEU 'energy title' and to open the way towards an EU Energy Policy. The Commission used the 'energy packages' to bring up climate change issues by dismantling monopolies in the energy sector and making it possible to support the introduction of renewable energy in the grid. This required state incentives that are contrary to the idea of competition in the common market, thus precipitating a final challenge to improve the state aid framework to become more supportive to climate change mitigation, and whose upcoming changes should address the gap between ambition and reality.

The chronology of the adoption of the EU's key policy documents and related legislation show that these challenges are addressed by the Commission through causality and in a systemic way in accordance with the available science. However, empirical data on state aid purposes, the range of renewable energy capacity deployment, shares in RES-based electricity generation and final RES energy consumption prove the need for serious reconsideration of current state aid policy and law in the area of climate and energy policy. The first warning is that achieving the 2020 targets is increasingly uncertain. The second warning is that the rate of annual capacity additions to accelerate renewable power must expand significantly to meet the IEA Sustainable Development Scenario share of half of generation by 2030. In this respect, the EU was in second place just after China until 2019. Concerning renewable electricity generation, the EU was in a slight lead over the North America region in 2018, but was generating half as much RES electricity than the Asia Pacific region. The State Aid Scoreboard 2018 shows that aid in the form of a reduction of environmental taxes represents $^{1}/_{3}$ of aid provided under GBER for the period 2014-2017 which is 20 times more than the sum of support provided for investment and operating aid for RES promotion. Moreover, the Renewable Energy Progress Report of April 2019 shows that the overall EU share of renewable energy in final energy consumption by 2020 will be between 18.1% and 20.7%. However, 11 Member States are considered likely to fail to meet their national targets by 2020. Seven Member States were considered to be on the right track to reach national targets depending on their ability to reduce demand for energy. Nine Member States could reach national targets by 2020 if they engage in cooperation processes aiming at joint RES energy projects or support schemes. This opens the way for RED 2018 to facilitate Member States through new initiatives to support renewable energy through cooperation in joint projects and joint support schemes. When the EU is considered a 'green leader', it is important to bear in mind that the share of renewable electricity was about 31% of the electricity consumed in the EU in 2017, where one third of that total was generated by hydropower, another third by wind,

and the final third by all other technologies. In 2019, ironically enough, China was found to be on course to meet its low-set Paris targets, while the US had the largest decline in energy-related CO_2 emissions.

With all these figures in mind, an understanding of what being the 'green leader' means could be difficult to agree on. The EU is consistent in its attempts to meet the Paris Agreement commitments. Until now, the EU has succeeded in meeting its own targets, albeit with numerous difficulties. However, it could be argued that the EU has achieved these targets at the expense of its own economy, downscaling industry and manufacturing, while its growing services sector is still heavily dependent on gas and oil imports for transport, heating and even electricity generation from gas plants that replaced the old coal power plants. The EU economy is based on common interest, ultimately represented by the internal market with undistorted competition. The question is whether it is time for the EU to reconsider its understanding of 'common interest' by putting more weight on climate change mitigation at the expense of certain elements of competition policy where compatible state aid could make a difference. The implications of state aid for renewable energy generation are twofold. On one hand, too much support for renewable energy could create distortion of competition against conventional energy, but, more importantly, it could also create disbalance in favour of intermittent energy sources and problems in electricity supply. On the other hand, too strict state aid scrutiny could discourage crucial renewable energy projects necessary to meet the EU climate and energy goals if the focus of state aid is on protecting the competitiveness of intensive energy industries. Such a situation requires a balance between different legitimate aims where both state aid policy and law are at the centre of the discussion. Further research is therefore required on the impact of competition policy in general on renewable energy, since the focus of this paper is on the interaction between climate change objectives and state aid regulations through an assessment of GBER, RED and EEAG faced with relevant data resulting from EU activities in this respect. The impact of the state aid regime, as a part of EU competition policy, is perhaps no greater on renewable energy than on other energy sectors, but it is more important because of the pressing circumstances in regard to climate change mitigation and the probable consequences which have been scientifically established by the IPCC. Consideration should be given to whether the 'common interest' of the EU is to ease state aid scrutiny over investment and operating state aid for renewable electricity generation in order to give investors security in the energy sector that is supposed to increase six-fold by 2050. The same kind of consideration should be given to energy efficiency measures due to the fact that an energy-efficient EU could save up to 30% of currently spent energy, thus reducing the

burden of rapidly increasing renewable electricity generation that current technology can hardly cope with. Therefore, a future, more balanced state aid framework could be of key importance for the continuation of EU climate change mitigation efforts.

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